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INFLUENZA MORTALITY AMONG WAGE EARNERS AND THEIR FAMILIES.

A PRELIMINARY STATEMENT OF RESULTS.

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Whites rather than colored people were attacked by the pandemic of influenza and the young rather than the old, a reversal of usual conditions. These conclusions are based on the accurate figures obtainable from 12,000,000 policies and 105,552 claims. : : :

THE following is a brief statement of some of the basic findings of an investigation which has been made into the epidemic of influenza. It is limited to the policyholders of the Industrial Department of the Metropolitan Life Insurance Company and covers the period from October 1, 1918 to June 30, 1919. It should be noted in this connection that in this department there are represented over 12,000,000 policyholders, as of December 31, 1918; that these policyholders include both races, white and colored, males as well as females, and all age periods, excepting early infancy and extreme old age. This group of insured wage earners is well distributed over the entire United States and Canada. Effort was made, furthermore, to make the record of influenza deaths as complete as possible. In all, 105,552 policy claims were paid during the period under investigation, representing a total of 70,729 deaths from influenza-pneumonia.* It will be seen from these considerations that the results of this study should be generally applicable to the working population of the United States. Only crude descriptive data are given and no attempt will be made to give results which depend upon refined statistical analysis. Such work is still being carried on and will be reported on in a later and fuller statement.

*Includes all deaths classified as "influenza" (10), "broncho-pneumonia" (91), and "pneumonia-lobar and undefined" (92). The numbers refer to titles of the International List of Causes of Death.

The 70,729 deaths included in this study were largely concentrated during the first three months, namely, October, November, and December of 1918. In fact, slightly more than three fourths of all the deaths from influenza-pneumonia in the nine months under observation occurred in these three months. The month of October alone showed 34,471 deaths or nearly one half of all the deaths in the entire period. In this epidemic, there was no clearly defined preparatory period leading up to the month of greatest incidence. The following table shows the percentage distribution of the deaths according to single months, and by quarters:

TABLE 1.

ACTUAL AND CUMULATIVE NUMBER OF DEATHS FROM INFLUENZA-PNEUMONIA, DURING EACH CALENDAR MONTH, OCTOBER, 1918 TO JUNE, 1919.

Actual and Cumulative Percentage in Each Month of Total in Period.

Period	Number	Percentage	Cumulative number	Cumulative percentage
October, 1918 to June, 1919	70,729	100.0	70,729	100.0
By month:				
October	34,471	48.7	34,471	48.7
November	10,506	14.9	44,977	63.6
December	8,227	11.6	53,204	75.2
January	6,724	9.5	59,928	84.7
February	3,925	5.6	63,853	90.3
March	3,677	5.2	67,530	95.5
April	1,829	2.6	69,359	98.1
May	1,058	1.5	70,417	99.6
June	312	.4	70,729	100.0
By quarter:				
Oct. to Dec., 1918	53,204	75.2	53,204	75.2
Jan. to Mar., 1919	14,326	20.3	67,530	95.5
Apr. to June, 1919	3,199	4.5	70,729	100.0

It will be seen that the epidemic was virtually over by the end of March. A few thousand deaths occurred in the last quarter, April to June, but not to an excessive degree when it is remembered that there are always deaths from these causes at this time of the year, especially in April. It will be desirable, therefore, to call attention to the facts by quarterly periods, remembering that the first quarter from October to December represented the period of severest incidence, the second quarter from January to March, the period of secondary recurrences and the third quarter, April to June, the return toward the usual low rates of the late spring and early summer months.

DEATH RATE FROM INFLUENZA-PNEUMONIA.

When related to the number of years of life exposed, these deaths indicate a rate of 774 per 100,000 during the nine months' period. This is an annual rate; that is, it is what the rate would have been if the experience had continued for a full year. In October, the death rate was 3,395 per 100,000; in November, 1,035, the figures declining rapidly thereafter, with a slight halt, however, in the months of February and March. The month of March is a high influenza-pneumonia month in any year. As against these rates for the epidemic period, there was a rate of 152 per 100,000 during the twelve months ending September 30, 1918. The difference between 774 and 152 per 100,000, namely, 622 is an approximate measure of the effect of the epidemic. The year 1918, prior to the epidemic, was already significantly affected with mortality from respiratory disease, especially during March and April, when high death rates prevailed. During the period 1911 to 1917, considering these seven years as a *norm*, there was an annual influenza-pneumonia rate of 125 per 100,000.

On the basis of the rate for the year ending September, 1918, there would have been only 13,891 deaths as against the 70,729 that actually occurred.

Table 2 presents the rates by months and by quarters for the entire experience, as well as for white and col-

ored lives and for each sex group separately:

TABLE 2.

DEATH RATE PER 100,000 YEARS OF LIFE IN EACH MONTH, AND BY QUARTERS, OCTOBER, 1918 TO JUNE, 1919.

Classified by color and by sex.

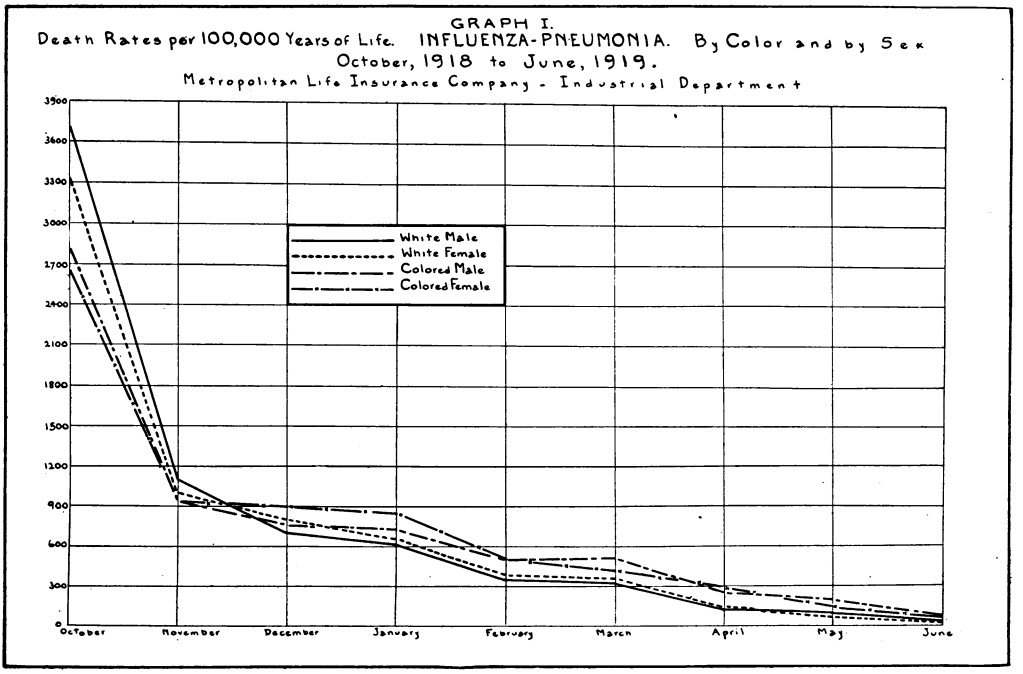
Period	Death rate per 100,000 years of life				
	Total	White		Colored	
		Males	Females	Males	Females
October, 1918 to June, 1919	774	789	763	767	767
By months:					
October....	3,395	3,674	3,325	2,816	2,664
November .	1,035	1,091	1,010	944	945
December .	810	768	833	807	902
January ...	662	607	672	741	869
February ..	387	354	382	515	517
March	362	325	358	528	488
April.....	167	160	169	288	297
May.....	104	97	89	204	182
June.....	31	29	28	60	42
By quarters:					
Oct. to Dec.	1,747	1,844	1,723	1,522	1,504
Jan. to Mar.	470	428	471	594	625
Apr. to June	105	95	95	184	174
"*Norm*" periods					
Oct., 1917 to Sept. 1918	152	164	116	316	215
Total, 1911 to 1917	125	126	107	217	167

Graph I illustrates these data.

SEX, COLOR AND AGE INCIDENCE OF INFLUENZA-PNEUMONIA.

The chief interest in the statistics of the influenza epidemic must center for some time around the relative incidence of the deaths in the sex, color and age groups of the population. Such statistics, if authoritative, throw light on the natural history of the disease, indicating to the epidemiologist where its invasion was most or least disastrous and where he may concentrate his research. To the public health officer and to the medical profession generally, these data will indicate, perhaps, where forces for the control of this disease should be concentrated.

In view of the importance of these practical bearings, it will be necessary, of course, that such figures describing the relation between the disease and groups of the population be consistent, not only for the various phases of the epidemic, but for the different parts of



the country where the epidemic occurred. This is assured by the uniform methods of classification employed, and by the special efforts which were made to have these statistics as accurate as possible. We shall discuss the relations between these data for sex, color and age in this order.

Sex-Incidence of Influenza-Pneumonia Mortality.

The respiratory diseases, including influenza-pneumonia, under normal conditions, show a higher mortality incidence among males than among females. In the seven year period from 1911 to 1917, the mortality rate showed an excess of 18 per cent, males over females, among white lives and of 30 per cent among colored lives. This then is the background against which the figures for the epidemic must be thrown. We find that for the entire period from October, 1918 to June, 1919, the rates for males and females, respectively, were 789 and 763 among white lives and 767 for both males and females among colored lives. In other words, the excess of males over females among the whites was only 3 per cent, and there was no excess at all among colored lives. These figures are shown in Table 2.

This would seem to indicate, therefore, that the effect of the epidemic was not much (if any) greater on males than on females. In fact, once we pass the crest of the epidemic, we find in the quarter from January to March, 1919, that the death rates for males are even lower than for females. There is, altogether, a suggestion that the excess mortality caused by the epidemic did not operate on the sexes as the normal mortality from influenza-pneumonia had in previous years. This fact of excess respiratory disease among females is in itself one well worthy of more intensive study, especially, when it is remembered, that a considerable number of deaths of females were assigned to the puerperal causes which were undoubtedly complicated by attacks of influenza, although not so certified by physicians. The following table summarizes the facts with reference to sex-ratios in the two main color groups and by quarterly periods:

TABLE 3.

Percentage, Male or Female Death Rate—Influenza-Pneumonia.

Classified by quarterly periods, October, 1918 to June, 1919.

Period	White	Colored
October, 1918 to June, 1919	103	100
October to December	107	101
January to March	91	95
April to June	100	106
Norm:		
October, 1917 to Sept., 1918	141	147
Total, 1911 to 1917	118	130

Color or Race Incidence of Influenza-Pneumonia Mortality.

The second consideration is with reference to color. In this connection, a very clear picture is presented. Normally, the respiratory diseases are much more highly represented among colored persons than among whites, and this applies to both sexes. Thus, in the seven year period, from 1911 to 1917, influenza-pneumonia showed an excess of 72 per cent colored males over white males, and of 56 per cent colored females over white females. But, during the period of the epidemic, the situation was reversed. The whites suffered from higher rates than the colored. This is clearly shown during the first three months of the epidemic, when colored males showed a rate of 1,522 per 100,000, as compared with a rate of 1,844 per 100,000 for white males. The same condition is shown among females, the colored rate being 1,504 and the white rate, 1,723. Put in other words, while the rate among white males dur-

ing this period, October to December, was nearly fifteen times as great as during the period 1911 to 1917, that of colored males was only seven times as great as the rate during the same seven year period. White females during the height of the epidemic showed a rate more than sixteen times as high as the normal, while colored females experienced a rate only nine times as high. After the first of January, 1919, that is, after the severest period of the epidemic had passed, the colored group showed higher rates than the white, and the amount of excess approximated what had prevailed in normal times, as the distance from the explosive period of the epidemic increased. In the last quarter, April to June, the excess of colored males over white males was 94 per cent and of colored females over white females, 83 per cent, figures which are almost identical with those for the twelve months ending September 30, 1918. The facts indicate with great clearness that the effect of the epidemic was much greater among white lives than among colored lives. This difference wore off as the epidemic waned and conditions returned to normal, as they virtually did during the last quarter of this period, from April to June, when a marked excess of colored mortality is shown over white mortality. The following table gives the relation of colored to white mortality by quarters for each of the two sexes:

TABLE 4.

PERCENTAGE, COLORED OF WHITE INFLUENZA-PNEUMONIA DEATH RATE.

Classified by sex and by quarters, October, 1918 to June, 1919.

Period	Percentage colored of white	
	Male	Female
October, 1918 to June, 1919	97	101
October to December	83	87
January to March	139	133
April to June	194	183
Norm:		
October, 1917 to Sept. 1918	193	185
Total, 1911 to 1917	172	156

AGE INCIDENCE OF INFLUENZA-PNEUMONIA MORTALITY.

It is when we consider the facts for age that the most instructive relations with reference to the influenza-pneumonia epidemic are brought out. We shall find that during the period of the attack, the disease affected the population in a manner distinctively its own, and this is quite different from that in which the diseases known as influenza and pneumonia affect the community at large during non-epidemic periods. During normal times, as indicated by the facts for the seven year period from 1911 to 1917, we find that influenza-pneumonia affects primarily the first age period of life, ages one to four years, and the period of late middle life and old age. The rates are normally minimal between 5 and 30 years. The picture of the pandemic by age groups shows three modal points instead of two. In fact, the highest rate among the whites is in the period of early adult life, namely, between 25 and 34 years, where, as we remarked above, the normal rates are minimal. Among the colored group this age period also shows a very high point but it is not as high as that in the first five years of life.

EXCESS INFLUENZA-PNEUMONIA MORTALITY.

When considered from the point of view of *excess* influenza-pneumonia mortality, we find that the epidemic affected most the period of early infancy and early childhood, the period of early adult life and culminated between 25 and 34 years. The period of old age shows no significant *excess* during the period of the epidemic. The figures for April to June are very much lower than for the normal period, but these data are ob-

viously incomparable because of the differences in season, the age "norm" for 1911 to 1917 being based upon entire calendar years.

The chief characteristics of this peculiar age incidence of the influenza-pneumonia mortality are shown in the following graph for each color and sex. A solid line or other configuration is presented for each one of the three quarterly periods of the study. Graph III shows more clearly than the figures, the three modal points, especially during the last quarter of the year 1918. During the first two quarters of 1919, the points of difference from the normal are less prominent and later become entirely submerged in the "norm." The outstanding fact is that for white males during a considerable age period of active adult life, deaths from influenza-pneumonia occurred during the three months of October to December which, if they had continued for a whole year at that rate, would have removed approximately 4 per cent of the population at those ages; among white females, 3½ per cent; among colored males, approx-

TABLE 5.

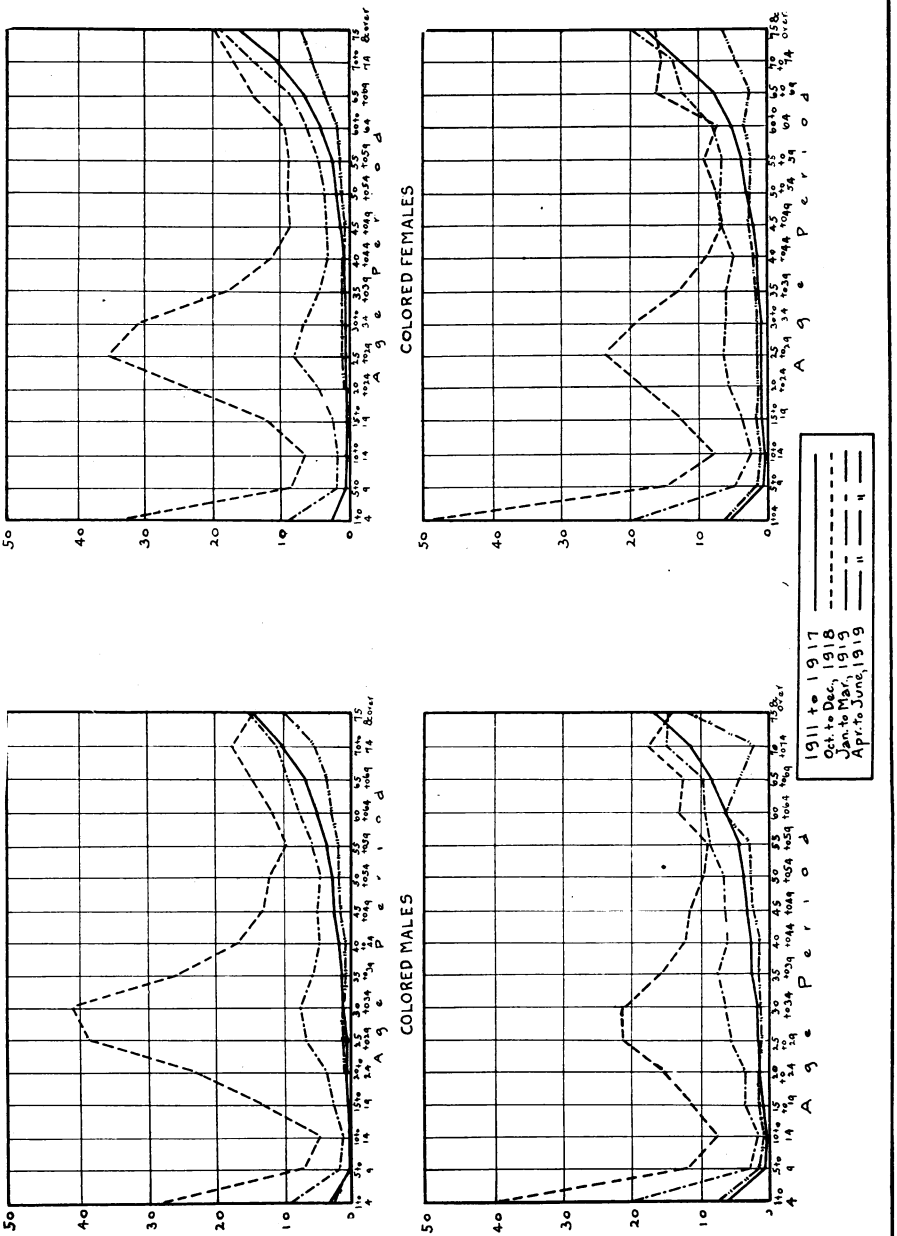
DEATH RATES PER 100,000 YEARS OF LIFE—INFLUENZA-PNEUMONIA—1911 TO 1917 AND VARIOUS QUARTERS OF EPIDEMIC PERIOD COMPARED.

(Rates less than 1911 to 1917 norm. shown in bold-face.)

Color; Age	Males									Females								
		Oct. '18 to June, '19		Oct. to Dec., '18		Jan. to Mar., '19		Apr. to June, '19			Oct. '18 to June, '19		Oct. to Dec., '18		Jan. to Mar., '19		Apr. to June, '19	
	1911 to 1917	Rate	(Oct. to June)—(1911 to 1917)	Rate	(Oct. to Dec.)—(1911 to 1917)	Rate	Jan. to Mar.)—(1911 to 1917)	Rate	(Apr. to June)—(1911 to 1917)	1911 to 1917	Rate	(Oct. to June)—(1911 to 1917)	Rate	(Oct. to Dec.)—(1911 to 1917)	Rate	(Jan. to Mar.)—(1911 to 1917)	Rate	(Apr. to June)—(1911 to 1917)
White persons: All ages—one and over	127	789	662	1844	1717	428	301	95	**32**	107	763	656	1723	1616	471	364	95	12
1 to 4	261	1300	1039	2806	2545	857	596	238	**23**	237	1449	1212	3218	2981	887	650	243	6
5 to 9	32	312	280	733	701	160	128	43	11	33	377	344	900	867	190	157	40	7
10 to 14	14	198	184	479	465	100	86	15	1	17	282	265	673	656	147	130	26	9
15 to 19	27	518	491	1296	1269	230	203	29	2	20	487	467	1201	1181	235	215	24	4
20 to 24	36	881	845	2273	2237	322	286	49	13	25	946	921	2304	2279	474	449	58	33
25 to 29	60	1532	1472	3878	3818	651	591	67	7	34	1471	1437	3511	3477	810	776	93	59
30 to 34	99	1628	1529	4075	3976	714	615	95	**4**	44	1289	1245	3084	3040	693	649	90	46
35 to 39	138	1081	943	2569	2431	574	436	101	**37**	58	767	709	1760	1702	462	404	78	20
40 to 44	188	724	536	1671	1483	407	219	93	**95**	77	500	423	1114	1037	317	240	68	**9**
45 to 49	228	639	411	1291	1063	502	274	125	**103**	106	417	311	850	744	328	222	71	**35**
50 to 54	291	613	322	1199	908	451	160	189	**102**	158	465	307	896	738	384	226	115	**43**
55 to 59	378	569	191	994	616	550	172	165	**213**	246	487	241	870	624	461	215	131	**115**
60 to 64	496	729	233	1149	653	784	288	255	**241**	410	572	162	930	520	611	201	175	**235**
65 to 69	699	923	224	1494	795	925	226	350	**349**	676	857	181	1386	710	842	166	343	**333**
70 to 74	1015	1125	110	1758	743	1088	73	528	**487**	1039	1198	159	1664	625	1387	348	542	**497**
75 and over	1416	1288	**128**	1411	**5**	1481	65	972	**444**	1644	1501	**143**	1982	338	1844	200	678	**966**
Colored persons: All ages—one and over	216	767	551	1522	1306	594	378	184	**32**	166	767	601	1504	1338	625	459	174	8
1 to 4	593	2223	1630	3965	3372	1975	1382	730	137	553	2483	1930	4873	4320	1946	1393	629	76
5 to 9	66	532	466	1201	1135	290	224	105	39	64	694	758	1463	1399	488	424	132	68
10 to 14	35	321	286	763	728	144	109	56	21	42	363	321	781	739	231	189	75	33
15 to 19	76	537	461	1133	1057	346	270	131	55	77	602	525	1263	1186	391	314	153	76
20 to 24	120	687	567	1559	1439	377	257	126	6	85	833	748	1826	1731	563	478	110	25
25 to 29	149	928	779	2131	1982	545	396	108	**41**	80	1024	944	2307	2227	639	559	126	46
30 to 34	164	975	811	2134	1970	653	489	138	**26**	88	893	805	1935	1847	613	525	132	44
35 to 39	221	824	603	1540	1319	786	565	147	**74**	116	681	565	1288	1172	609	493	147	31
40 to 44	241	660	419	1228	987	610	369	143	**98**	131	508	377	886	755	491	360	146	15
45 to 49	304	674	370	1181	877	619	315	223	**81**	170	515	345	665	495	673	503	208	38
50 to 54	390	641	251	994	604	658	268	271	**119**	269	585	316	762	493	732	463	261	**8**
55 to 59	458	701	243	921	463	903	445	278	**180**	381	619	238	941	560	680	299	235	**146**
60 to 64	629	959	330	1312	683	934	305	631	2	513	615	102	717	204	789	276	341	**172**
65 to 69	830	888	58	1243	413	977	147	444	**386**	782	1019	237	1621	839	1223	441	214	**568**
70 to 74	1136	1154	18	1780	644	1484	348	198	**938**	1268	1105	**163**	1524	256	1325	57	464	**804**
75 and over	1635	1340	**295**	1418	**217**	1418	217	1182	**453**	1783	1416	**367**	1634	**149**	1961	178	654	**1129**

GRAPH II

Death Rates per 1,000 Years of Life INFLUENZA-PNEUMONIA. By Color, Sex and by Age Period
Quarters, Oct 1918 to June 1919, and Years 1911 to 1917 Combined Metropolitan Life Insurance Company - Industrial Department.



imately 2 per cent, and for colored females, nearly 2½ per cent. In the first five years of life, the annual rate was a little less than 3 per cent for white males rising to a maximum of 5 per cent among colored females. These are the crude measures of the severity of this epidemic.

One thing is clear, namely, that we are concerned in this epidemic with a disease or group of diseases which behave very differently from the way in which the disease known by the same names affected the community in previous years. The question is very properly suggested by the figures whether we are dealing in the two periods, *i. e.*, the endemic and the epidemic periods, with the same disease entities. No other disease for which reliable figures are at hand shows similar divergencies as to age incidence in different periods of time. The color relations also suggest a similar query. These peculiar relations of age and color incidence for the epidemic period are strikingly alike throughout the country. As such relations are ordinarily not subject to much variation, the changes in the period of the epidemic at least suggest that we may be concerned with a different causative agent. This problem, however, is not within the sphere of the statistician whose function is to call the attention of the epidemiologist to the facts. It is the proper business of the latter to determine in the last analysis between the identity and lack of identity between the endemic and epidemic "influenzas" and "pneumonias."

Much further study is required to clear up the meaning of these age relations in the several color and sex groups. Work along these lines is being carried on and gives much encouragement in view of the completeness and high degree of accuracy of the data for insured wage earners, both as to lives exposed and number of deaths for each color, sex and age group. Graph II and Table 5 give the basic facts with reference to age, sex and color for each one of the three month periods of the epidemic and for the "norm," that is, the years 1911 to 1917.

For the present, we give on graph III the *excess* of influenza-pneumonia experience in each quarter over the "norm" 1911 to 1917 for each color and sex class.

Mortality from Other Diseases During the Epidemic Period.

In the last quarter of 1918, a number of changes in death rates from other diseases than influenza and the respiratory diseases occurred. These changes may throw light on the nature of the epidemic since, in many cases, they were the direct resultant of the epidemic itself. This is clearly the case in connection with the increase from the puerperal diseases and it is suggested that a similar relation may have occurred in connection with the increase in mortality from pulmonary tuberculosis and heart disease. We find on comparing the death rate of the last quarter of 1918 with that of the last quarter of 1917 that whooping-cough increased among white lives from 5 to 11 per 100,000; and among colored lives, from 8 to 14. It is, of course, possible that some of these cases of whooping-cough were truly influenza or at least complicated by influenza and were confused by the physicians in the statement of cause of death. The tuberculosis death rate increased from 143 to 162 among white lives; but, among the colored, there was a decrease, 378 to 335. For organic diseases of the heart, we find an increase from 130 to 154 per 100,000 among white lives, and from 211 to 217 among the colored. Too great stress cannot be put on these figures, especially among the colored; the white change may be significant. The greatest difference occurred in connection with the puerperal diseases which increased from 15 to 55

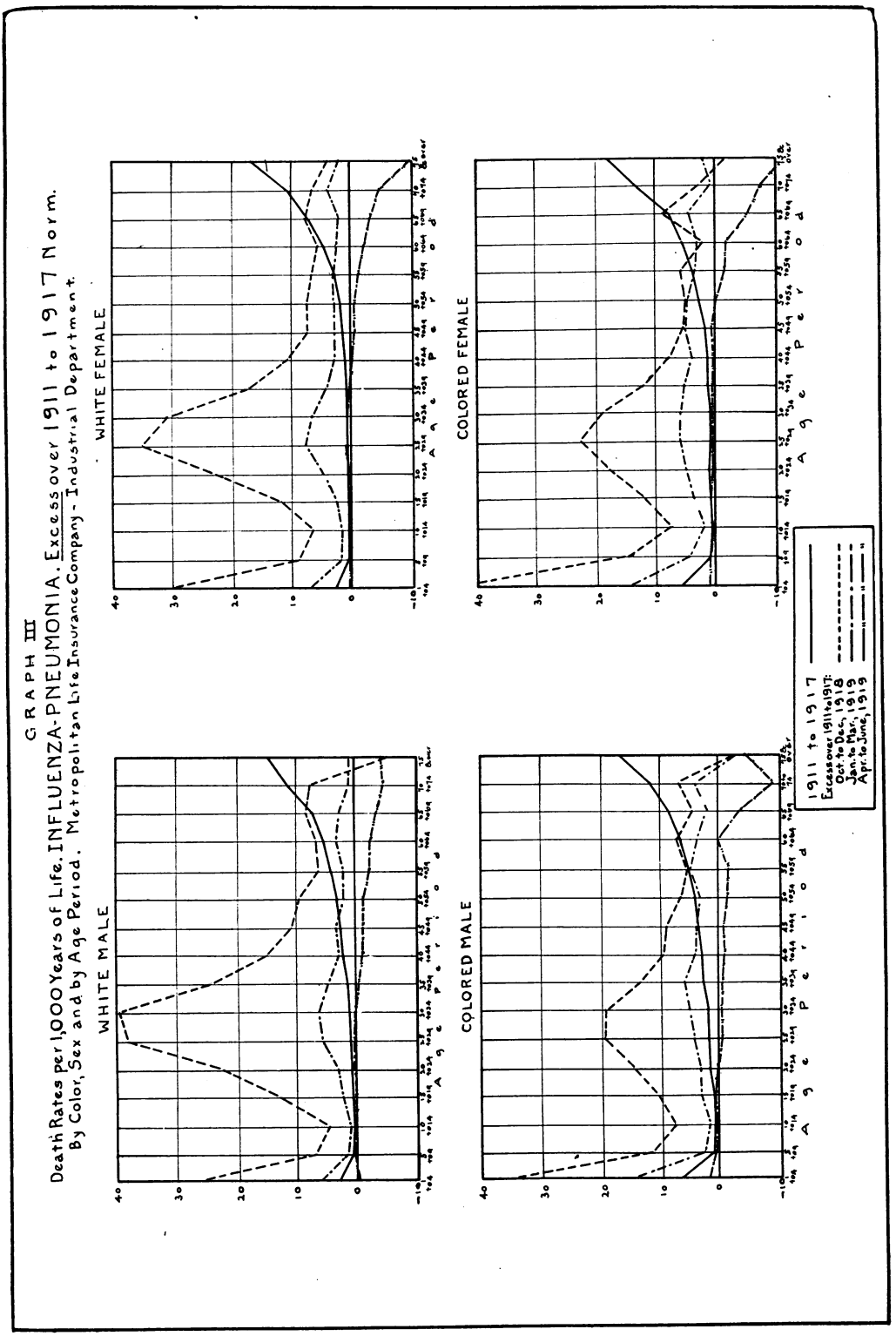

GRAPH III
Death Rates per 1,000 Years of Life. INFLUENZA-PNEUMONIA. Excess over 1911 to 1917 Norm.
By Color, Sex and by Age Period. Metropolitan Life Insurance Company - Industrial Department.
WHITE FEMALE
COLORED FEMALE
WHITE MALE
COLORED MALE
Age Period
1911 to 1917
Excess over 1911 to 1917:
Oct. to Dec., 1918
Jan. to Mar., 1919
Apr. to June, 1919

TABLE 7.

CLAIM RATE PER 1,000 POLICIES (ANNUAL BASIS).

Influenza-Pneumonia During Period October, 1918 to June, 1919.

Area	Influenza-pneumonia claim rate per 1,000 Oct. '18 to June '19
UNITED STATES AND CANADA	8.1
United States	8.2
Canada	7.3
BY GEOGRAPHIC DIVISIONS:	
New England	8.9
Middle Atlantic	9.1
East North Central	6.4
West North Central	6.2
South Atlantic	8.8
East South Central	7.6
West South Central	9.0
Mountain	5.6
Pacific	5.8
BY STATES:	
New England	
Maine	7.9
New Hampshire	9.9
Vermont	9.6
Massachusetts	8.9
Rhode Island	8.7
Connecticut	9.3
Middle Atlantic	
New York	7.8
New Jersey	9.1
Pennsylvania	11.2
East North Central	
Ohio	7.1
Indiana	6.2
Illinois	6.5
Michigan	5.2
Wisconsin	5.4
West North Central	
Iowa	6.0
Kansas	6.9
Nebraska	7.2
Minnesota	5.1
Missouri	6.2
South Atlantic	
Delaware	11.9
Maryland	9.8
District of Columbia	9.1
Virginia	8.2
West Virginia	8.4
North Carolina	9.0
South Carolina	8.6
Georgia	6.4
Florida	7.1
East South Central	
Alabama	8.3
Kentucky	8.0
Tennessee	7.0
West South Central	
Arkansas	5.6
Louisiana	10.1
Oklahoma	6.2
Mountain	
Colorado	14.0
Idaho	4.1
Montana	5.2
Utah	5.1
Pacific	
Washington	4.2
Oregon	4.0
California	6.3
BY CITIES:*	
Maine	
Lewiston	6.3
Portland	9.9
New Hampshire	
Dover (N. H.)	10.5
Manchester	9.2
By Cities (cont.)	
Vermont	
Burlington	9.8
Massachusetts	
Boston	9.6
Brockton	12.1
Cambridge	7.7
Fall River	8.7
Framingham	8.6
Holyoke	8.1
Lawrence	8.2
Lowell	8.4
Lynn	9.1
Malden	7.2
New Bedford	9.9
Newton	7.5
Pittsfield	10.8
Salem	8.4
Somerville	8.4
Springfield	9.0
Taunton	9.1
Worcester	8.7
Rhode Island	
Pawtucket	9.9
Providence	8.4
Woonsocket	9.7
Connecticut	
Bridgeport	8.0
Derby	10.5
Hartford	9.2
New Haven	7.9
New London	9.2
Norwich	10.1
Stamford	9.7
Waterbury	10.3
New York	
Albany	10.1
Amsterdam	8.0
Auburn	7.5
Binghamton	7.8
Buffalo	6.3
Cohoes	10.0
Elmira	6.9
Glens Falls	13.3
Hempstead	8.4
Mt. Vernon	7.4
Newburgh	9.3
New York City	7.7
Niagara Falls	8.2
Rochester	5.5
Schenectady	7.3
Syracuse	6.9
Troy	10.8
Utica	6.9
Watertown	11.6
Yonkers	7.8
New Jersey	
Atlantic City	9.5
Bayonne	9.2
Bloomfield	8.3
Burlington	9.6
Camden	10.7
Dover (N. J.)	12.0
Elizabeth	8.6
Hackensack	6.4
Hoboken	8.8
Irvington	9.2
Jersey City	10.5
Jersey City Hts.	8.6
Newark	8.1
New Brunswick	8.7
Orange	7.7
Passaic	7.7

*Includes influenza-pneumonia experience of all policies "in force" in districts having their offices in specified cities. District terri.

TABLE 7.—*Continued.*

CLAIM RATE PER 1,000 POLICIES (ANNUAL BASIS).

Influenza-Pneumonia During Period October, 1918 to June, 1919.

Area	Influenza-pneumonia claim rate per 1,000 Oct. '18 to June '19
By Cities (cont.)	
New Jersey (cont.)	
Paterson	9.4
Plainfield	10.4
Red Bank	10.3
Trenton	11.2
Union Hill	7.0
Woodbury	11.0
Pennsylvania	
Allentown	7.8
Braddock	12.3
Chester	10.1
Harrisburg	9.2
Johnstown	7.2
Lancaster	11.8
McKeesport	11.6
Millvale	12.0
New Castle	8.0
Norristown	11.4
Philadelphia	11.0
Pittsburgh	11.9
Pottsville	23.1
Reading	10.2
Scranton	10.6
Uniontown	10.3
Wilkes Barre	13.3
Williamsport	12.3
Ohio	
Akron	6.5
Canton	7.5
Cincinnati	7.9
Cleveland	6.7
Columbus	6.0
Dayton	5.5
Elmwood Place	8.3
Springfield	6.1
Steubenville	9.1
Toledo	4.6
Youngstown	9.0
Zanesville	7.1
Indiana	
Evansville	6.1
Fort Wayne	4.1
Indianapolis	6.1
Muncie	5.6
New Albany	6.0
South Bend	6.5
Hammond	—
Illinois	
Alton	7.5
Belleville	7.4
Carbondale	7.2
Chicago	5.9
East St. Louis	6.9
Peoria	9.4
Quincy	7.3
Rockford	7.0
Springfield	7.2
Michigan	
Detroit	5.1
Grand Rapids	4.7
Wisconsin	
Bay View	5.0
Milwaukee	5.2
Iowa	
Davenport	6.1
Des Moines	5.9
Ottumwa	6.3
Kansas	
Kansas City	6.0
Nebraska	
Omaha	7.3
Minnesota	
Duluth	4.6
Minneapolis	3.7
St. Paul	5.4
By Cities (cont.)	
Missouri	
Kansas City (Mo.)	5.8
Moberly	7.1
Poplar Bluff	10.1
Sedalia	7.3
St. Joseph	6.1
St. Louis	5.9
Delaware	
Dover (Del.)	10.2
Wilmington	13.1
Maryland	
Baltimore	9.6
Cumberland	14.0
Hagerstown	11.0
Havre de Grace	8.1
Dist. of Columbia	
Washington, D. C.	9.1
Virginia	
Norfolk	7.5
Richmond	8.7
West Virginia	
Clarksburg	7.6
Wheeling	9.3
North Carolina	
Charlotte	10.8
Greensboro	7.3
Raleigh	9.5
Georgia	
Atlanta	6.0
Augusta	7.5
Columbus	6.5
Macon	6.6
Savannah	6.3
Florida	
Jacksonville	7.6
Alabama	
Birmingham	7.5
Mobile	7.7
Kentucky	
Covington	8.1
Lexington	7.2
Louisville	7.4
Paducah	8.0
Paris	8.4
Tennessee	
Chattanooga	8.7
Jackson	7.5
Knoxville	4.7
Memphis	7.1
Nashville	7.3
Arkansas	
Little Rock	4.5
Louisiana	
New Orleans	10.3
Utah	
Salt Lake City	4.5
Washington	
Seattle	4.2
Oregon	
Portland	4.0
California	
Los Angeles	5.9
Oakland	6.4
San Francisco	6.2
San Jose	8.2
Canada	
Hamilton	6.3
Montreal	8.0
Ottawa	11.5
Quebec	8.5
Sherbrooke	12.8
Three Rivers	11.1
Toronto	5.8
Vancouver	6.1
Winnipeg	4.9

among white lives and from 23 to 42 among colored. This marked change in the puerperal death rate followed directly from a large number of accidents of pregnancy and accidents of labor which were induced by the influenza attack.

The following table shows the facts with reference to the changed mortality in the two corresponding quarters of 1917 and 1918. But, it must not be assumed that the figures are complete or conclusive. It may well be that some of these diseases, like Bright's disease, do not as yet show the effect on them as the result of the influenza epidemic, but that it will require a longer period, perhaps years, to show what the impairments of the kidney, which physicians report as common in their practice, had on the death rate from renal diseases.

TABLE 6.

DEATH RATE PER 100,000 FROM NON-INFLUENZAL DISEASES.

Last Quarters of 1918 and 1917 Compared by Color.

Cause of death	White		Colored	
	Oct. to Dec. '18	Oct. to Dec. '17	Oct. to Dec. '18	Oct. to Dec. '17
Typhoid fever	14	13	29	28
Measles	2	3	—	1
Scarlet fever	3	5	—	—
Whooping-cough	11	5	14	8
Diphtheria and croup	27	36	6	13
Tuberculosis—all forms	162	143	335	378
Tuberculosis of the lungs	149	131	309	349
Tuberculous meningitis	6	6	7	10
Meningitis	7	6	6	7
Cerebral hemorrhage, apoplexy	60	63	92	98
Organic diseases of the heart	154	130	217	211
Bright's disease	75	90	138	154
Total puerperal state	55	15	42	23
Puerperal septicemia	6	6	10	12
Puerperal albuminuria and convulsions	5	4	7	5
Other diseases and conditions of the puerperal state	43	5	25	6

INFLUENZA-PNEUMONIA EXPERIENCE IN VARIOUS PARTS OF THE UNITED STATES AND CANADA.

At the present time we can also offer some statistics showing the comparative death rates from influenza-pneumonia in the several main geographic regions of the United States and in Canada, for the period October, 1918 to June, 1919. The mortality rates are expressed as "claim rates," that is, the number of claims from influenza-pneumonia paid during this period per 1,000 policy-years exposed to risk. Thus, for the total company experience of this nine-month period, there was an influenza-pneumonia claim rate of 8 per 1,000. In the United States the figure was 8 and in Canada it was 7 per 1,000. Considering the experience according to broad geographic divisions the New England, Middle Atlantic, South Atlantic and West South Central States showed a rate of 9 per 1,000. The East North Central, West North Central, Mountain and Pacific States each recorded a rate of 6 per 1,000. The group of East South Central States registered a rate of 8 per 1,000. Considering individual states, Pennsylvania and Delaware showed the highest rates, 12 per 1,000, with New Hampshire and Vermont, Maryland and Louisiana following with rates of 10 per 1,000. As a general conclusion from these statistics of influenza mortality by states it may be said that the highest rates were experienced in those states having port cities and the least for the inland states.

In Table 7 we give not only the data for the geographic divisions and for states but also for a number of the leading cities in each of these states. While the data are given for the state of Colorado and for the city of Denver, no importance should be attached to the rates because the lives represented were but recently insured and were consequently limited to those ages where influenza affected the population most. This makes the rates for Colorado noncomparable with those for other states where the age and sex distribution of the outstanding policies conforms more nearly to normal.